

eichrom

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Resolve™ Filters

UGM05 - 09/12/05 - Manchester

Outline

- **Filter characteristics**
- **QC**
- **External product evaluation**
- **Internal evaluation**
- **Summary**

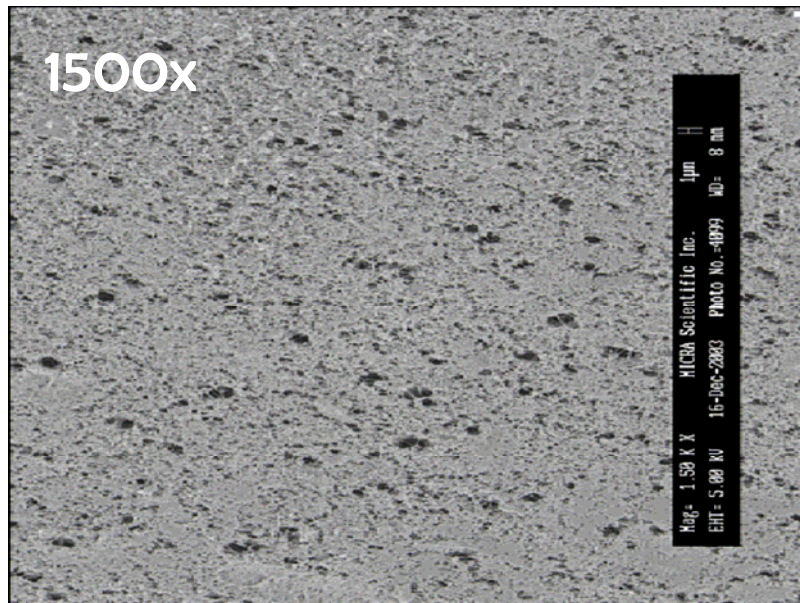
Characteristics

- **Material: polypropylene**
- **Porosity: 0.1 μm**
- **Diameter: 25 mm**

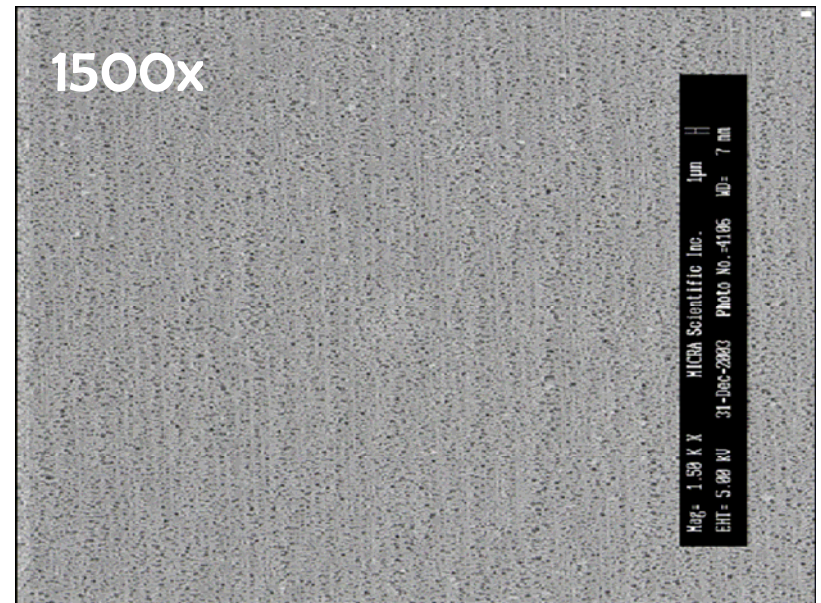
QC

- **Screening of filter material roll stock**
- **SEM**
 - Visual evaluation
 - Pore size uniformity: subjective
 - determination
- **Alpha Spectrometry**
 - Am-241/243; 50 μ g Ce
 - FWHM each peak \leq 50 keV

Filters comparison

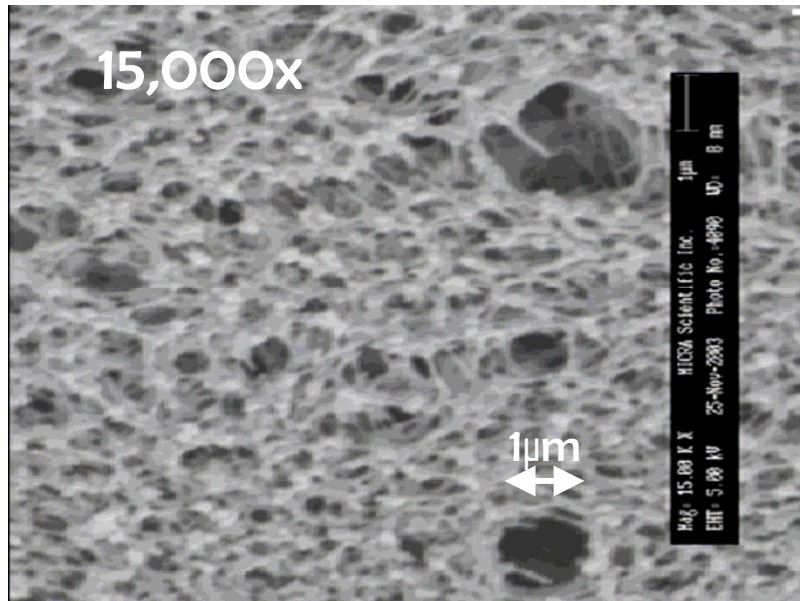


Known as « poor » performing lot



Known as « good » performing lot

“0.1 micron” pore size filter



- Rated to remove 99.98% of particles $>0.1\mu\text{m}$
- Surface pores $>0.1\mu\text{m}$ will occur

External Product Evaluation

- **Barry Stewart, Carlsbad EMRC**
- **Am 241/243**
- **With and without substrate**
- **ASTM C1163-98, LaF3 ppt., 50 μ g La carrier**
- **“Glossy side” up and down**

External Results

Sample	Substrate	Orientation	FWHM (keV)	Am-243 recovery	Am-241 recovery
1	No	Glossy down	28	98.4 %	98,4 %
2	No	Glossy down	25	95,7 %	95,5 %
3	No	Glossy up	22	101,9 %	97,6 %
4	No	Glossy up	26	100,2 %	99,3 %
5	No	Glossy down	25	100,5 %	96,1 %
6	Yes	Glossy down	23	98,6 %	97,0 %
7	Yes	Glossy up	25	95,1 %	94,8 %
8	Yes	Glossy up	26	97,6 %	95,0 % ₈

Internal evaluation of Resolve™ Filters

- Tests of reproducibility
 - Peak area surface

 - FWHM

RN	# replicates	SD (%)
^{232}U	6	4.6
^{243}Am	6	2.2
^{239}Pu	6	6.4
^{226}Ra	6	4.6

RN	# replicates	SD (%)
^{232}U	6	12.6
^{243}Am	6	12.3
^{239}Pu	6	9.5
^{226}Ra	6	10.1

Evaluation of Resolve™ Filters

- Tests of repeatability

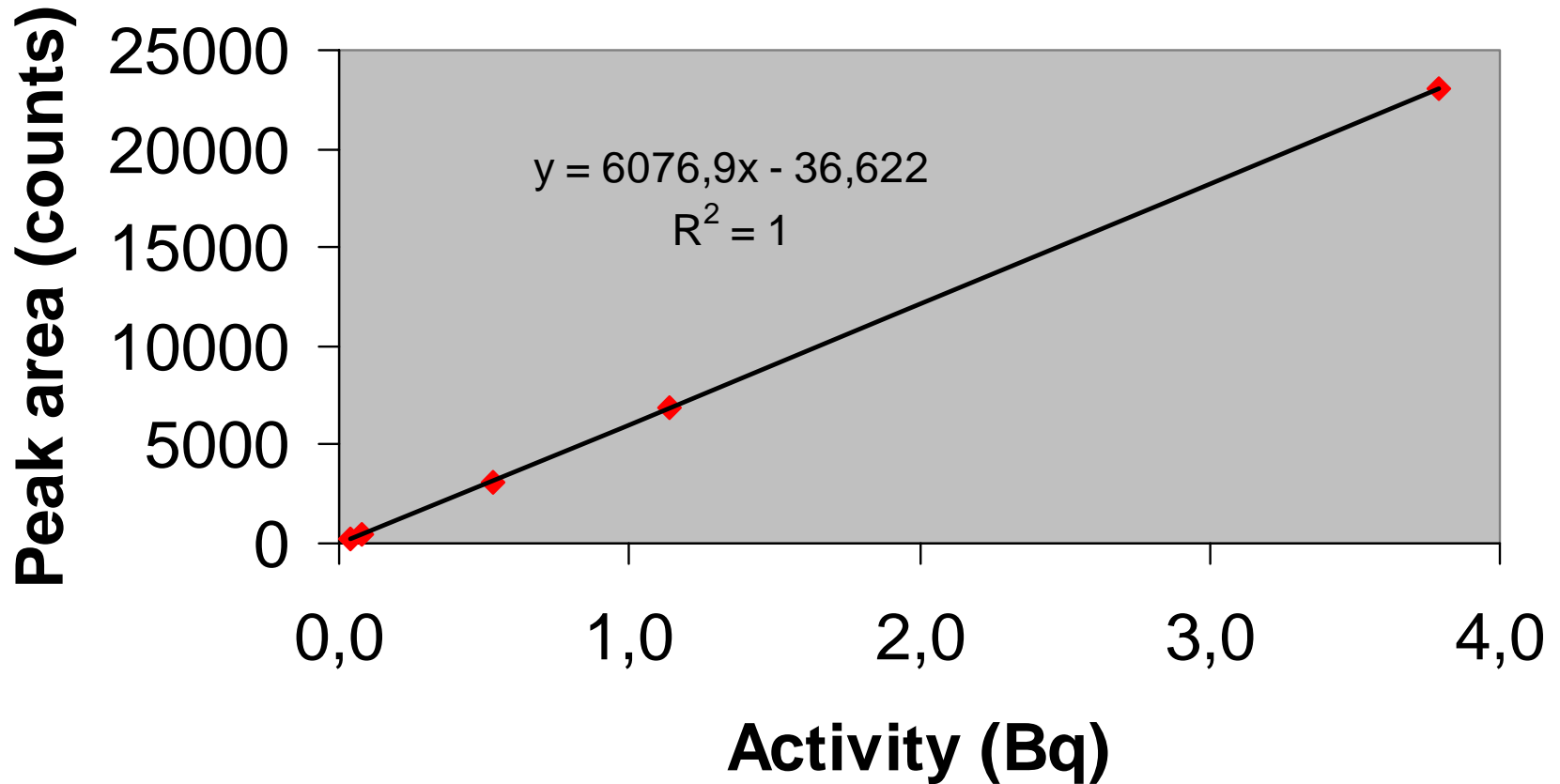
- Peak area surface

- FWHM

RN	# replicates	SD (%)
²³² U	9	1.9
²⁴³ Am	10	1.4
²³⁹ Pu	9	4.1
²²⁶ Ra	10	3.1

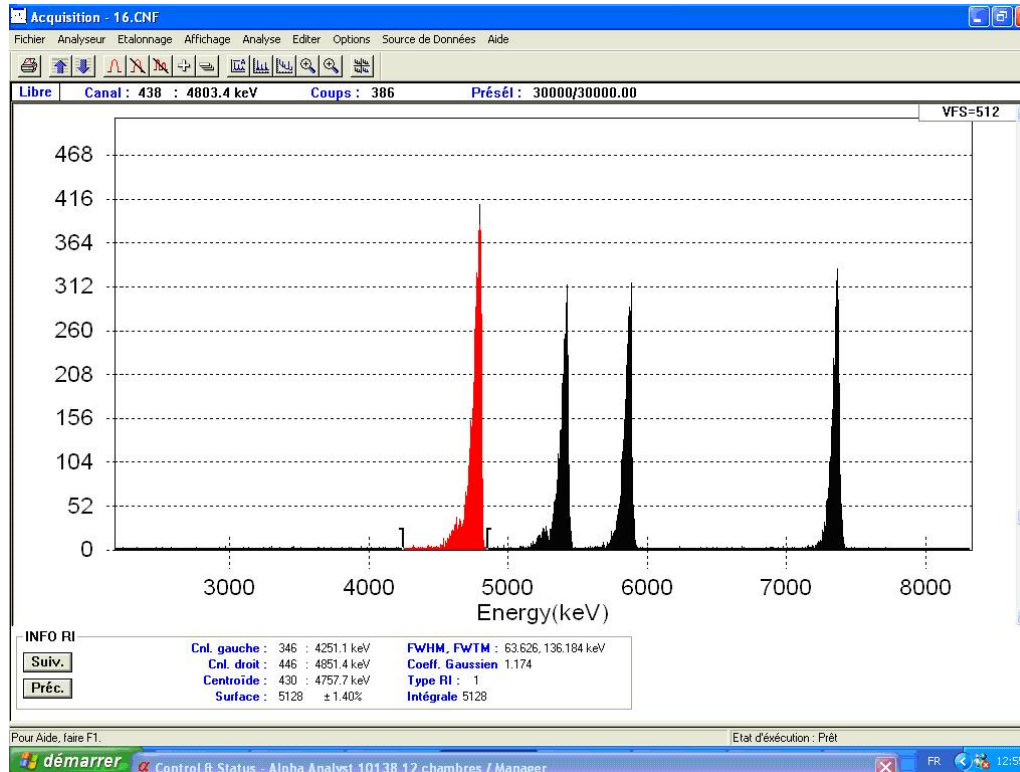
RN	# replicates	SD (%)
²³² U	9	3.7
²⁴³ Am	10	7.3
²³⁹ Pu	9	9.0
²²⁶ Ra	10	11.4

Linearity of peak area



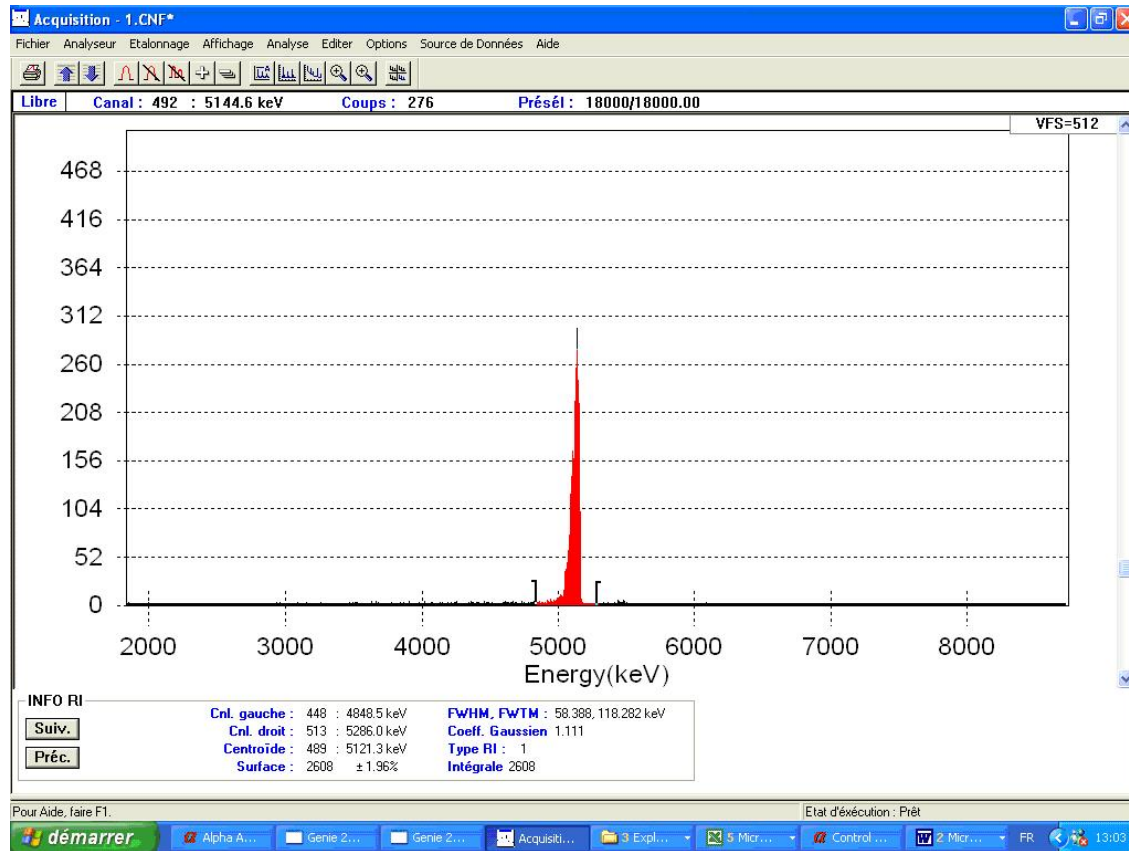
- Test for ^{226}Ra at 4784 keV

α -spectrometry: results



- ^{226}Ra α -spectrum, FWHM = 54,3 keV

α -spectrometry: results



- ^{239}Pu α -spectrum, FWHM = 55,3 keV

Micro-precipitation

- α -spectrometry
- Ra: easiest way to measure
- Rapid method for routine compared to electrodeposition
- Less expensive than electrodeposition

Summary

- Eichrom now supplies a 0.1 μ m polypropylene filter for alpha spec source preparation
- Quality control for pore size homogeneity by SEM
- Both side filter equivalent
- Consistent reproducibility and repeatability
- Good resolution